A51

Assessing Exposure to Environmental Tobacco Smoke: The Use of Airborne and Biological Markers.

M.J. Reasor, Department of Pharmacology and Toxicology, West Virginia University Health Sciences Center, Morgantown, W. Va., USA.

Numerous reports have appeared recently examining the potential for health effects from exposure to environmental tobacco smoke (ETS). A major problem in interpreting the purported health effects has been an inadequate exposure assessment. The objective of this presentation is to critically evaluate the current status of ETS exposure assessment. Nicotine has been used as an ambient marker, and although it is tobacco specific, it is representative of principally gas phase components and has a different decay rate than other gas phase materials. The lack of specificity of respirable suspended particulate material for ETS has limited its usefulness as an airborne marker. Nicotine, and its metabolite cotinine, in body fluids, are employed widely as biological markers of ETS exposure. Limitations to their usefulness include the inability to quantitatively monitor long-term exposure to ETS, and possible confounding by dietary sources of nicotine. Low levels of DNA and protein adducts in nonsmokers exposed to ETS and their lack of tobacco-specificity have limited their application as biological markers to date.

*****

A52

Primary Prevention of Occupational Diseases: Anemophoresis.

Y.H.A. Hubert & J.M. Dupont, demi-Valeur c de toxicologie, fondamentale et industrielle CNAM, St Germain-en-laye, France.

Occupation-related diseases are likely to be contracted via the respiratory tract. For this reason, in any programme aimed at preventing such diseases, maintenance of high quality air must be paramount.

The concept, accepted in some countries, that there are concentrations of airborne pollutants that are acceptable is used to support the view that diluting toxic gases is sufficient to make the workplace safe. It is proposed that, instead, airborne substances which are hazardous to health should, as far as is possible, be isolated from workers, and that necessary exhaust vents should be swept with clean air flowing in the appropriate direction (away from workers) at a velocity of at least 80 cm/s. This system has been called anemophoresis and is characterised by the size of the vents and the rate of air flow. Two different arrangements for the vents are suggested, together with a system for testing the efficiency of the anemophoresis.

A53
The Effect of Building Finishing Materials on the Indoor Environment.
A.A. Massoud & O. Khalil, Banha University, Banha, Kaliubia, Egypt.

This paper examines the relationship between materials which are used to finish and furnish buildings, and the quality of the indoor environment, with the aim of constructing guidelines for the types of such materials which will lead to a healthy environment indoors. To this end, a hypothetical model has been constructed which relates the different elements involved to the indoor environment.

*****

A54
The Ability of Simple Parameters of Respiratory Dysfunction to predict Cardiovascular Mortality.
A.J.S. Gardiner, Medical Unit, Monklands Hospital, Glasgow, Scotland.

It has been well known by clinicians for many years that cardiac dysfunction may affect the respiratory system adversely, as in rheumatic valvular heart disease, and that the converse is very commonly the case in chronic obstructive airways disease. Measurements of respiratory function following myocardial infarction have been carried out frequently since the mid 1960s, and show a pattern characteristic of pulmonary dysfunction related to pulmonary congestion and/or pulmonary oedema. Thus, data are available relating coronary artery disease (CAD) and respiratory function. Recent analysis of epidemiological data acquired over long periods of time from cohort studies reveals a relationship between abnormal respiratory function, as evidenced by such simple observations as the presence of dyspnoea and the level of the FEV_1 value, and mortality from CAD. It is only comparatively recently that these adverse relationships regarding risk and mortality for CAD have been revealed. The most valuable prognostic element of a respiratory profile is breathlessness while walking in a non-inclined plane. A reduction in the FEV_1 value against the value predicted to be normal is shown to be associated with an increased risk of death not only by CAD in smokers and non-smokers but also and, most striking of all, in non-smokers without CAD.

A55
New Buildings: Problems of responsibility for indoor air quality maintenance.
P.E. O'Sullivan, The Bartlett School, University College, London, UK.

The processes by which buildings are designed, constructed, put to work and operated are considered, together with the impact of legally-binding responsibilities relating to health and safety upon these processes. Indoor health hazards can include the air but, in attempting to provide high quality indoor air, problems may arise such as those due to conflicts of professional roles, confusion among contractors or those associated with putting a building to work. With the ultimate aim of minimising such problems, suggestions of key areas for research will be presented.

*****

A56
Priorities for Toxicological Research of Volatile Organic Compounds in Indoor Air.
V.J. Feron, H.P. Til, Fl. de Vrijer & P.J. van Bladeren, TNO Toxicology and Nutrition Institute, Zeist, The Netherlands.

Indoor air is a variable complex mixture consisting of a large number of chemicals including many volatile organics to which humans are being exposed, on average, for about 19-21 h each day. It is virtually impossible to study the toxicology of all components and to set air quality guidelines for each individual chemical. Even if such information was available, one would still be confronted with the problem of a complex mixture with its numerous possible interactions. Setting priorities by experts including experienced toxicologists is a way out. The physical and chemical properties of compounds known to occur in indoor air show a great diversity, so the present paper is limited to the group of volatile organics. Classes of chemicals of major toxicological concern belonging to this group are aromatic hydrocarbons, saturated and unsaturated aliphatic hydrocarbons, a number of aldehydes and ketones, terpenes and glycolethers. Specific classes of toxicological concern such as nitrosamincs and isocyanates also contain volatile compounds, but are best considered separately. A number of individual compounds belonging to the volatile organics, such as benzene, formaldehyde, and styrene are not thought to constitute risk factors in indoor air, since ample toxicological data point that way. On the other hand, compounds such as acetaldehyde, acrolein, propanol and butadiene, and classes such as N-alkanes, glycolethers and terpenes (limonene, pinene) need more attention from toxicologists.

A57
Airborne Coughs and Colds.
D.A.J. Tyrrell, Salisbury, Wiltshire, UK.

Certain bacteria that reside in the environment, such as Legionella, may be transmitted to man indoors by the airborne route; other bacteria, such as Streptococcus pyogenes may spread from person to person in the same way. Most respiratory infections are due to viruses which cause colds, sore throats and a range of lower respiratory illnesses. These spread from person to person and appear usually in the home, work, school, etc. The exact mechanism is not determined. They can spread by the production and inhalation of airborne particles as a result of coughing and sneezing. They can also spread when nasal secretions contaminate skin or fomites and these are then transferred by finger to the nose or eye. However it is not clear which of these is the main route of transmission and the evidence will be outlined and discussed. There are important consequences of knowing the right answer.

*****

A58
Environmental Tobacco Smoke as a Risk Factor for Cardiovascular Disease.
A. Markham, J. Munby, J.M. Sneddon & D.F. Weetman, School of Pharmacology, Sunderland Polytechnic, Sunderland, UK.

There are two approaches taken in measuring the putative association between cardiovascular disease and exposure to environmental tobacco smoke (ETS). First, epidemiological studies, where it is not possible to find unequivocal evidence. Second, exposure studies in humans or animals in which any changes detected can be related to our current knowledge of the pathology of the diseases. The problems inherent to each approach will be reviewed critically from the point of view of the quality of the study or experimental design. There is no evidence of an association between ETS exposure and cardiovascular diseases from any investigation with an adequate design.

*****

A59
Opening remarks.
M.P. Guillemin, President of the International Occupational Hygiene Association, Lausanne, Switzerland.

Mr Chief Public Health Officer
Mr President of the International Association for Indoor Air Quality
Dear Colleagues from all over the world
Ladies and Gentlemen

It is quite an honour for me to officially open this first Indoor Air International Conference on Priorities for Indoor Air Research and Action. I would like to congratulate Frank Lunau president of

A59 (cont)

Indoor Air International and George Leslie chairman of the Organising Committee of this Conference and to express my thanks to all who have contributed to set-up and realise this very important conference.

In the late seventies it became more and more obvious that in a public health perspective, too much attention had been paid to the outdoor air pollution in regard to indoor air pollution. Very many people spend much more than 80% of their time in an indoor air environment and are therefore more exposed to indoor than outdoor air pollutants.

Since then a worldwide effort has been undertaken to evaluate the extent of the problem and to define the areas where research was first needed. The World Health organisation, for instance, organised a series of meetings of experts about the health aspects related to indoor air quality. From a public health point of view indoor air refers to several different environmental categories. At home we breathe our "private air", at work the air quality depends on our occupation, in public buildings the air is "occupational" for the employees working in these buildings and "public" for the other people, during transportation a lot of different situations occur. It is not easy sometimes to clearly define an environmental category which makes for instance the establishment of indoor air quality standards extremely difficult. The extent of this field, and the diversity of the problems make a multidisciplinary approach essential where the main two keywords are: communication and collaboration.

To communicate between different disciplines represent a first challenge in order to understand each other, to adapt the mentalities and fit together the strategies. The second challenge is to really collaborate in the field or in laboratories to identify, to assess and to solve problems.

The objective to have an adequate air quality is to protect the people's health, therefore the goals of all those involved in this field are to be able to perform reliable health risk assessment based on evaluation of the exposure to the significant air contaminants. If this assessment results in a health risk unacceptable by our society the ultimate goal is to eliminate it or to reduce it to an acceptable level.

The goals and objectives of Indoor Air International are in this respect quite similar to the ones of the International Occupational Hygiene Association (IOHA) that I represent here, with the only difference that this latter Association focus its attentions mainly on the work environment. I have been invited to open this conference as president of the IOHA and this makes me feel that the Organising Committee considers the occupational environment as an important part of our indoor environment, which is obviously also my opinion.

The topics to be discussed during this conference stress very important issues and I hope they will give rise to interesting discussions and exchanges between the participants which might lead to possible future collaboration between different centers. The perspectives open by this conference will certainly be quite promising, this depends on you! I wish you an interesting, fruitful and enjoyable conference.

Thank you for your attention.